The battle of Neighborhoods

Introduction

This project is about electing the best place for a restaurant in Paris. Due to the density of population in Paris, there is a lot of restaurants cafe and bistro everywhere. The huge metropolitan has many neighborhoods and the success of a restaurant depends in part in the location. Paris has 20 neighborhood which I investigated in this project and I used different criteria to reduce the number of possible locations to two and then to an optimal one. This project is of interest to the restaurant owners or future owners. It gives a good idea of the cost of neighborhood and their most common venues. This is important because if you choose for example to open a fast food place it would be better located near a university or offices however if it is a fine cuisine restaurant so better go with residential neighborhood or a fashion/shopping street.

Data

Foursquare was used to locate metro stations, cafes, bistros and restaurants in the first part. It is important to choose a location near a metro station and not too close to other restaurants and bistro. Foursquare was afterwards used to investigate the surrounding of the final two places selected by considering all the categories (shops, schools, office, galleries…) in order to understand what type of people(workers, shoppers, kids, teenagers..) are mostly there.

As the data of Foursquare have Nan as value for the name of the neighborhoods, but lists the postal Codes, I looked for a website that have the postal Code and the name of each neighborhood to complement my data:
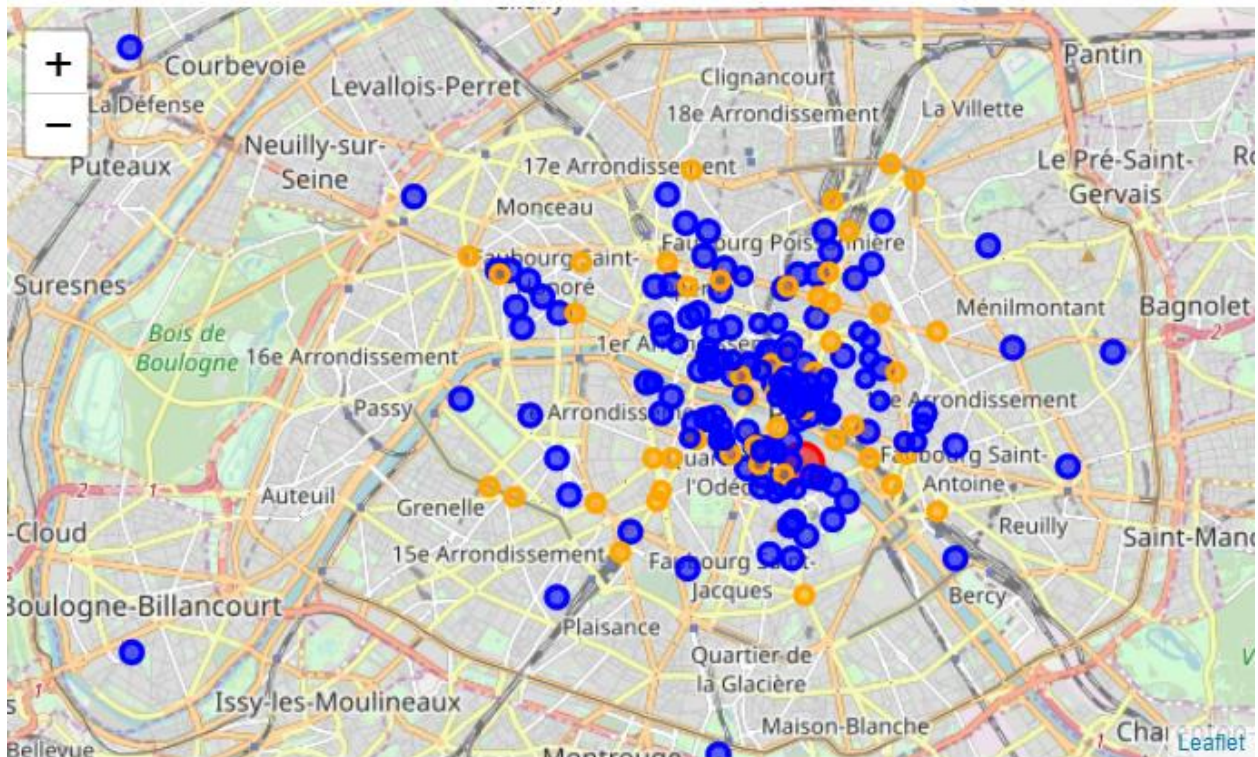
https://www.worldpostalcodes.org/en/france/arrondissement/map-of-postal-codes-in-paris

I couldn't find the exact cost of rent for commercial buildings for all neighborhoods so I compared instead the price per meter square based on this website, since it is also related to the type of neighborhood (residential, density of shopping places...

https://edito.seloger.com/actualites/barometre-lpi-seloger/paris-quel-prix-immobilier-dans-votre-arrondissement-article-31984.html,
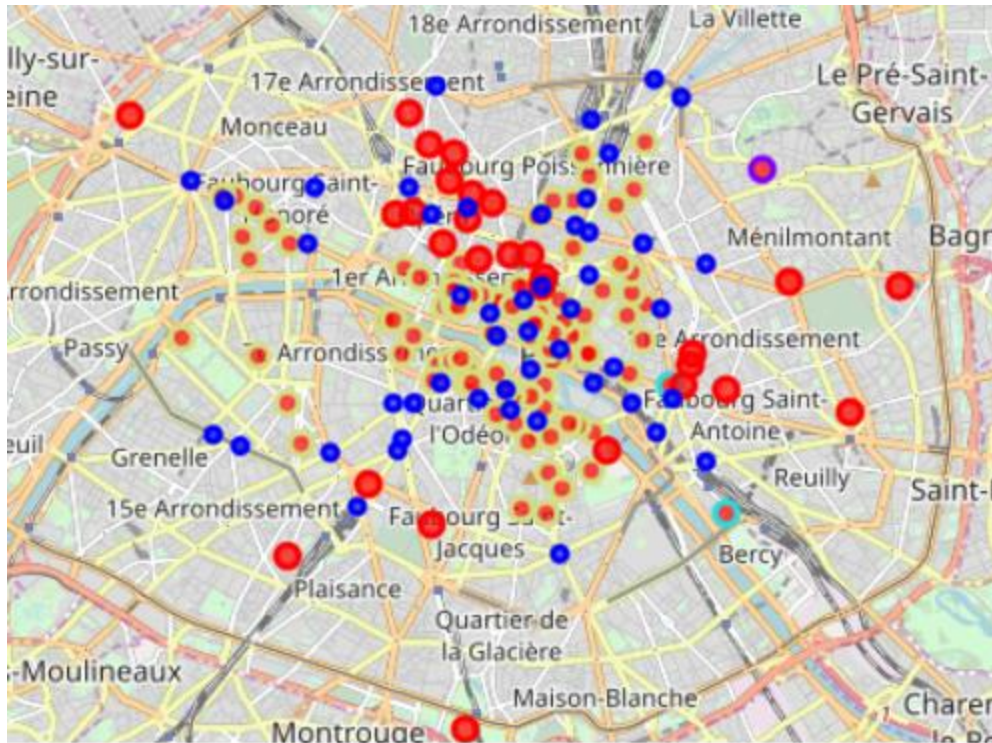
Methodology

The first step of this project is to locate the restaurants, bistros, and café as well as the metro stations. Like many known metropolitans there's an important percentage of the population that relies on metro instead of cars to move around. The data frame is the result of the merging of this data (blue) except the metro data (orange). The reason for this choice is that bistros and café are as famous as restaurants and have for many of them a lunch formula (sandwich, soup…)

Foursquare however gives a *Nan* value for the name of neighborhoods, so a website presenting the postal codes and the corresponding neighborhoods, was used to replace the missing data. the neighborhoods of Paris are 20 and are called with numbers: 1st, 2d, 3d '*arrondissement*' which is a french word for neighborhood.

One hot encoding was elaborated on this set of data to label the neighborhoods based on their most common venues. Among the four obtained clusters, the two more important have as first most common venues, bistro and restaurant and are represented with red dots and yellow dots filled with red.
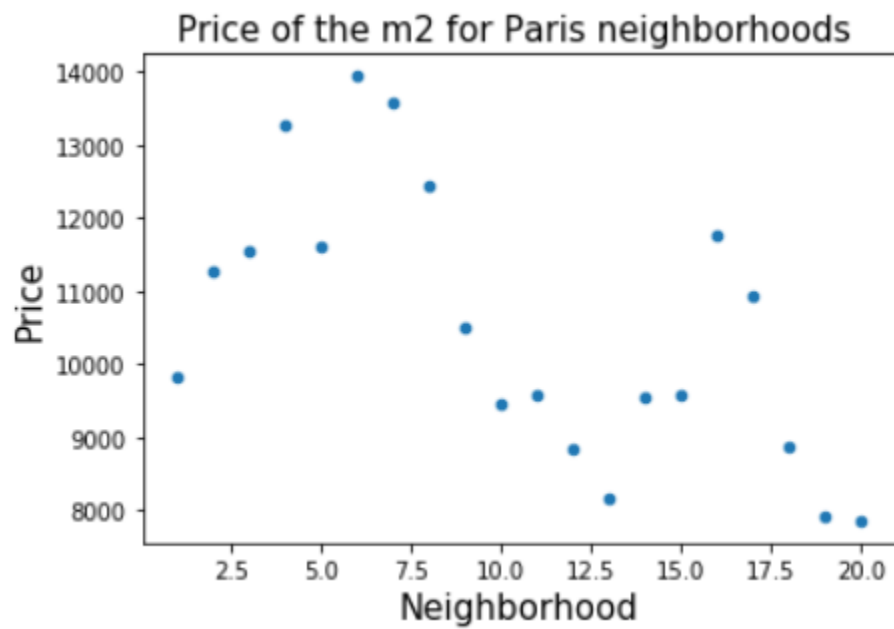
An important issue with commercial locals is the price of rent. It must be affordable enough for someone just starting business. An accurate estimate of the price of commercial rent by neighborhood could not be found. The following website was used instead, https://edito.seloger.com/actualites/barometre-lpi-seloger/paris-quel-prix-immobilier-dans-votre-arrondissement-article-31984.html. It results that:

The most costly neighborhood are: 6e (13 944 €/ m²), 7e (13 569 €/ m²), 4e (13 262 €/ m²) and the cheapest are: 20e (7 853 €/ m²), 19e (7 909 €/ m²) and 13e (8 156 €/ m²).
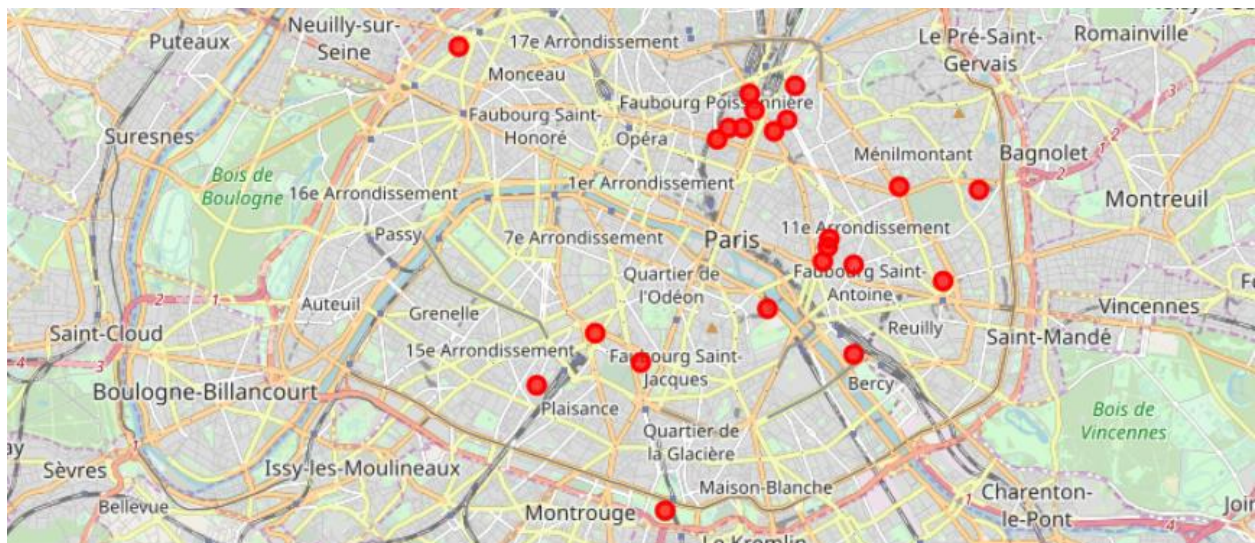
The prices for the 20 neighborhoods are gathered in the following graph. The following neighborhoods were selected as a probable location: 10,11,12,13,14,15,18,19,20. However, the 13, 18 and 19 don't have many restaurants and café meaning that they are more residential neighborhoods.
So the choice will be between 10,11,12,14,15 and 20.
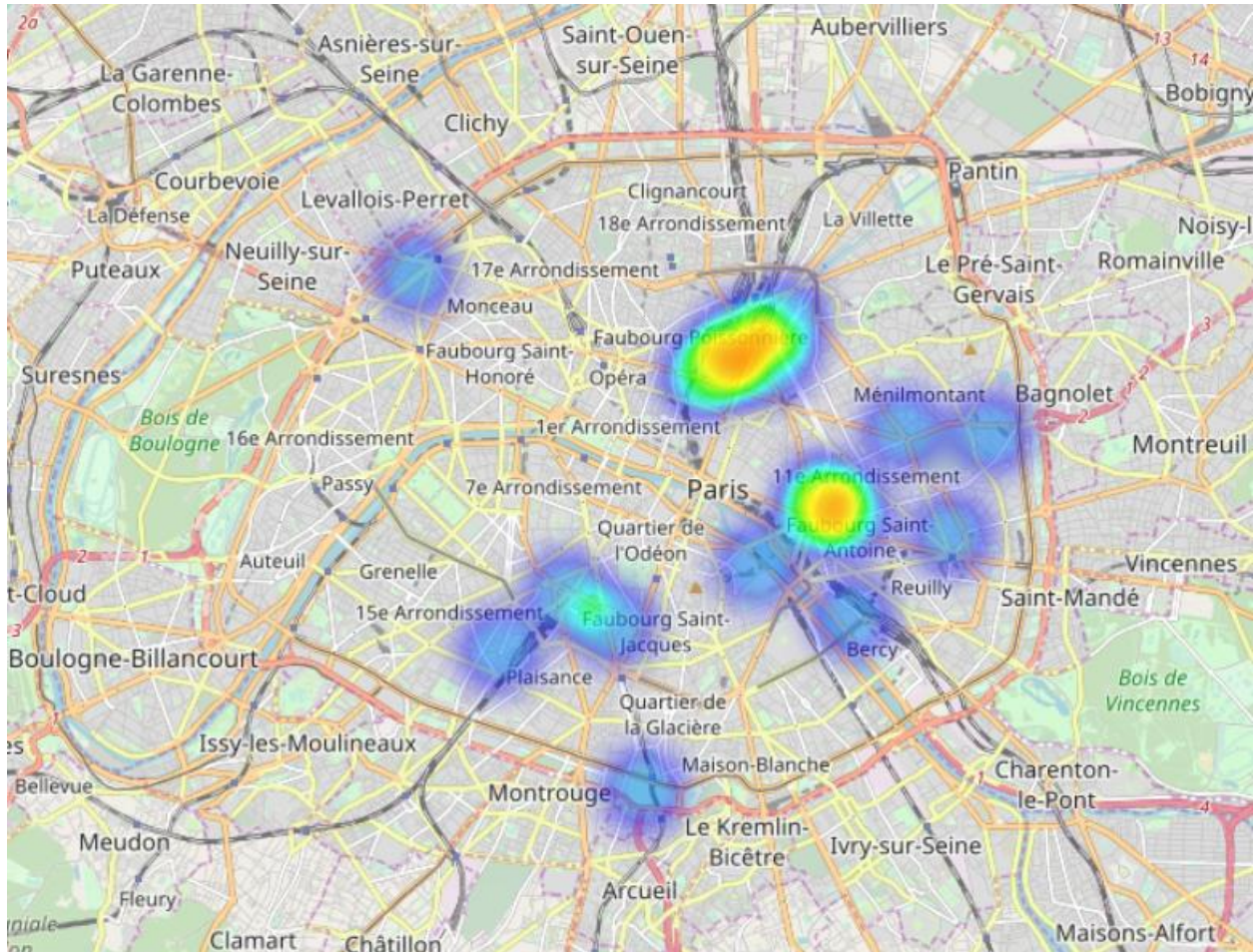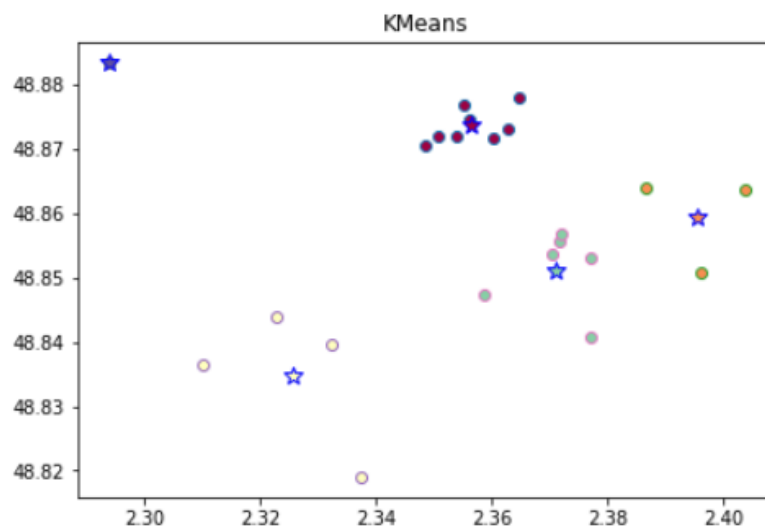
Price of the m2 for Paris neighborhoods

The following map shows the locations of the bistros, café and restaurant in the selected areas.

To have a better idea of the density of food places in these neighborhoods a heat map was created. It shows four clusters with a different density of venues

Since one of the clusters is bigger, it was considered as two clusters. To better select the coordinates kmeans clustering was used and the number of clusters was set to 5.

Among these clusters, one has a high density of food places (purple), one is empty(blue), which leaves the choice between 3 locations. For the three final locations selected, using the coordinates of the centers of clusters, the neighborhoods were explored with Foursquare to see how much it is convenient for a restaurant.

1) 2.39552425,48.85947888
2) 2.32563621,48.83474781
3) 2.37124654, 48.85119842

The second location has mainly a cemetery, a memorial site and a tech startup which lead to its discard. At last, two locations were selected one near la Bastille which is number 3 and one near place de La Nation (number 1). With foursquare, the categories of commerce surrounding the place were explored in order to select the optimal location.

Near la Bastille:

Results and discussion

La Bastille has a historic symbolic since it was where stood the prison of la bastille before its desruction.it is now a touristic site with the July column on its centre and many concerts and events take place there. It has also a well known nigh life with is night clubs, bars and restaurants.

Place de la Nation is known for having once had one of the most famous guillotines during french revolution. Nowadays it is the starting point of many Parisian demonstrations.

La Bastille (Source: https://www.paris.fr/pages/bientot-une-nouvelle-place-de-la-bastille-6093)

Place de la Nation (Source: https://www.tripbucket.com/dreams/dream/visit-place-de-la-nation-paris-france)

Both locations are close to many metro stations. To compare the surroundings, kmeans clustering was used to have a list of most common venues ,Table1 and 2. It appears that la Bastille has more attractive venues, more suited for the surrounding of a restaurant. It has also many hotels which makes tourists potential customers in addition to the locals.
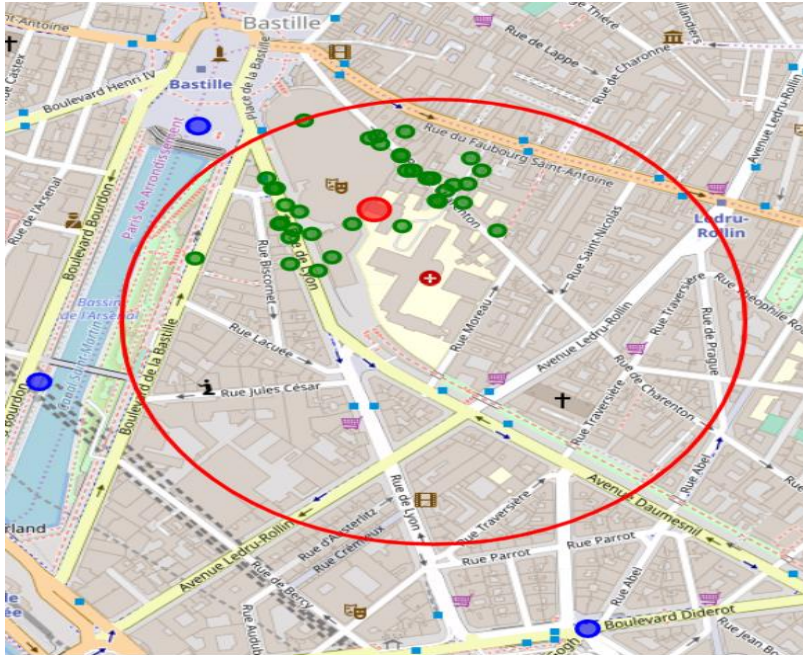
Close to la Bastille, seems to be a more attractive place for a restaurant. Concerning the speciality, it can be French since it is s a touristic place and tourists like to try local cuisine.

Table 1: Commercial shops close to the Bastille

	postalCode	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
0	75004	Wine Shop	Hotel	Art Gallery	Asian Restaurant	Bar	Brasserie	Burger Joint	Conference Room
1	75006	Jewelry Store	Wine Shop	Hotel	Art Gallery	Asian Restaurant	Bar	Brasserie	Burger Joint
2	75011	Tech Startup	Wine Shop	Hotel	Art Gallery	Asian Restaurant	Bar	Brasserie	Burger Joint
3	75012	Hotel	Italian Restaurant	Mediterranean Restaurant	General Entertainment	Brasserie	Health & Beauty Service	Hobby Shop	Bar
4	75017	Animal Shelter	Hotel	Art Gallery	Asian Restaurant	Bar	Brasserie	Burger Joint	Conference Room
5	94340	Burger Joint	Wine Shop	Hotel	Art Gallery	Asian Restaurant	Bar	Brasserie	Conference Room

Table 2: Commercial shops close to Place de la Nation

	location.postalCode	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue
0	75011	Flower Shop	Doctor's Office	Hotel	Miscellaneous Shop	Office	Dentist's Office	Pharmacy	Building
1	75012	Café	Wine Shop	Dive Bar	Coworking Space	Dance Studio	Dentist's Office	Department Store	Diner
2	75020	Optical Shop	Doctor's Office	Furniture / Home Store	Chinese Restaurant	Paper / Office Supplies Store	Japanese Restaurant	Clothing Store	Hotel

Conclusion

As a conclusion, near la Bastille seems an affordable and convenient spot for a restaurant due to its proximity to metro station and the density of commerce around. Foursquare was helpful to reach this result but other sources were also needed. The speciality of this restaurant can be chosen according to the population of the neighborhood. A french restaurant, bistro of café is also a good idea due to the number of hotels nearby.